

# Guneet Singh Dhillon

## Curriculum Vitae

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📄 [guneet-dhillon.github.io](https://guneet-dhillon.github.io)

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## Education

- Oct 2021 - Current **University of Oxford**, Oxford, UK  
**D.Phil. in Statistics**
- **Advisors** : Prof. Yee Whye Teh, Prof. Arnaud Doucet, Prof. George Deligiannidis, Dr. Tom Rainforth
  - **Funding** : Clarendon Fund Scholarship, University of Oxford (only 1 awardee from the Department of Statistics)
  - **College** : St. John's College
- Aug 2014 - May 2018 **University of Texas at Austin**, Austin, TX, USA  
**B.Sc. in Computer Science with Honors - Turing Scholars Honors**  
**B.Sc. in Mathematics with Honors** **GPA: 3.89 / 4.00**
- **Undergrad Honors Thesis** : Training Ising Models on Images using Sparsitron (Advisor - Prof. Adam Klivans)
  - **Certificate** : Applied Statistical Modeling
  - **Minor** : Economics
  - **Research Programs** : Freshman Research Initiative, College of Natural Sciences  
Directed Reading Program, Department of Mathematics

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## Work Experience

- Dec 2023 - Current **Machine Learning Intern**, *Boson AI USA Inc.*, Santa Clara, CA, USA
- Jul 2018 - Sep 2021 **Applied Scientist II** (Dec 2019 - Sep 2021) and **Applied Scientist I** (Jul 2018 - Dec 2019), *Amazon Web Services, Inc.*, Pasadena, CA, USA
- Developed the algorithm *Uniform Sampling over Episode Difficulty* for few-shot image classification with Prof. Stefano Soatto (NeurIPS 2021 spotlight publication)
  - Developed the algorithm *Transductive Fine-tuning* for few-shot image classification with Prof. Stefano Soatto (ICLR 2020 publication)
  - Devised algorithms for the *Amazon Textract* product [link] (U.S. patent)
  - Devised algorithms for the *Amazon Rekognition Custom Labels* product [link]
  - Won prizes for constructing innovative solutions for other products via hackathons
- May 2017 - Aug 2017 **Software Development Engineer Intern**, *Amazon Web Services, Inc.*, Palo Alto, CA, USA
- Developed the algorithm *Stochastic Activation Pruning* for robust image classification with Prof. Anima Anandkumar (ICLR 2018 publication)
- May 2016 - Aug 2016 **Machine Learning Intern**, *CognitiveScale Inc.*, Austin, TX, USA
- Built a search and recommendation system using probabilistic nonnegative matrix factorization and Gibbs sampling techniques, with Dr. Ayan Acharya
- May 2015 - Aug 2015 **Software Technology Engineering Intern**, *Dell Inc.*, Austin, TX, USA
- Implemented a Windows 10 Universal App. to connect and share features between devices

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## Publications

- May 2024 **On the Expected Size of Conformal Prediction Sets** [pdf]  
**Guneet S. Dhillon**, George Deligiannidis, Tom Rainforth
- In Proceedings of **International Conference on Artificial Intelligence and Statistics (AISTATS) 2024**

- Dec 2021 **Uniform Sampling over Episode Difficulty** [pdf]  
Sébastien M. R. Arnold\*, **Guneet S. Dhillon**\*, Avinash Ravichandran, Stefano Soatto  
\* Equal contributions  
o In Proceedings of **Advances in Neural Information Processing Systems (NeurIPS) 2021 (Spotlight)**
- May 2020 **A Baseline for Few-Shot Image Classification** [pdf]  
**Guneet S. Dhillon**, Pratik Chaudhari, Avinash Ravichandran, Stefano Soatto  
o In Proceedings of **International Conference on Learning Representations (ICLR) 2020**  
o Short version in Proceedings of Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS) 2019 (Spotlight)
- May 2018 **Stochastic Activation Pruning for Robust Adversarial Defense** [pdf]  
**Guneet S. Dhillon**, Kamyar Azizzadenesheli, Zachary C. Lipton, Jeremy Bernstein, Jean Kossaifi, Aran Khanna, Anima Anandkumar  
o In Proceedings of **International Conference on Learning Representations (ICLR) 2018**  
o Short version in Proceedings of Machine Deception Workshop, Conference on Neural Information Processing Systems (NeurIPS) 2017

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## Theses

- May 2018 **Training Ising Models on Images using Sparsitron** [pdf]  
Undergraduate Honors Thesis  
o Advisor : Prof. Adam Klivans  
o Co-Advisor : Dr. Philipp Krähenbühl

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## Patents

- Nov 2020 **Structured Document Analyzer** [pdf], U.S. Patent 10,839,245  
**Guneet S. Dhillon**, Vijay Mahadevan, Yuting Zhang, Meng Wang, Gangadhar Payyavula, Viet C. Nguyen, Rahul Bhotika, Stefano Soatto

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## Other Articles

- Sep 2020 **Erratum Concerning the Obfuscated Gradients Attack on Stochastic Activation Pruning** [pdf]  
**Guneet S. Dhillon**, Nicholas Carlini

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## Talks and Presentations

- Uniform Sampling over Episode Difficulty**  
Feb 2022 Seminar on Continual-Learning/Meta-Learning/Transfer-Learning, Google DeepMind
- A Baseline for Few-Shot Image Classification**  
Jul 2021 Workshop on Computer Vision with Limited Labels, Amazon Computer Vision Conference  
Dec 2019 Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS)  
Jul 2019 Workshop on Computer Vision Services/Systems in Amazon, Amazon Machine Learning Conference  
Jul 2019 Workshop on Data-Efficient Learning Techniques for Amazon Scale, Amazon Machine Learning Conference

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## Academic Services

### Organizing Committee Member

- 2024 ELLIS Robust Large Language Models Workshop  
2024 ELLIS Robust Machine Learning Workshop  
2023 ELLIS Robust Machine Learning Workshop

### Program Committee Member

- 2022 Conference on Lifelong Learning Agents (CoLLAs)

## Reviewer

Conference on Neural Information Processing Systems (NeurIPS)  
International Conference on Machine Learning (ICML)  
International Conference on Learning Representations (ICLR)  
International Conference on Artificial Intelligence and Statistics (AISTATS)  
Conference on Lifelong Learning Agents (CoLLAs)  
Amazon Machine Learning Conference

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## Teaching

### Teaching Assistant

Oct 2022 - Jan 2023 Foundations of Statistical Inference, Department of Statistics, Oxford (*George Deligiannidis*)  
Jan 2016 - May 2016 Matrices and Matrix Calculations, Department of Mathematics, UT Austin (*John Gilbert*)

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## Honors and Awards

Oct 2021 - Current Clarendon Fund Scholarship, Oxford (*only 1 awardee from the Department of Statistics*)  
Aug 2017 - May 2018 Out-of-State Tuition Waiver, College of Natural Sciences, UT Austin (*only 5-7 awardees*)  
Aug 2017 - May 2018 Thomas and Elizabeth Merner Scholarship in Natural Sciences, College of Natural Sciences, UT Austin  
Aug 2017 - May 2018 Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Department of Computer Science, UT Austin  
Apr 2018 College Scholar, College of Natural Sciences, UT Austin  
Aug 2016 - May 2017 Motorola Endowed Scholarship, Department of Computer Science, UT Austin  
Apr 2017 College Scholar, College of Natural Sciences, UT Austin  
Aug 2015 - May 2016 Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Department of Computer Science, UT Austin  
May 2015 - Aug 2015 TIDES FRI Summer Research Fellowship, College of Natural Sciences, UT Austin  
Aug 2014 - May 2015 Freshman Scholarship, College of Natural Sciences, UT Austin (*only 5% of freshmen awardees*)  
Aug 2014 - May 2015 Schein Memorial Scholarship, Department of Computer Science, UT Austin

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## Other Research Projects

Jan 2016 - Dec 2017 **Clustering and Prediction in Time-Series Data**, with Dr. Sinead Williamson  
Clustering time-series data and predicting future values by modeling the data using an infinite mixture of probabilistic auto-regressive models, learned using Gibbs sampling techniques  
Nov 2017 - Dec 2017 **Generative Adversarial Networks (GANs) for Adversarial Training** [pdf], course project  
Robust image classification using a generator-discriminator formulation to train deep networks  
Nov 2016 - Dec 2016 **Conflict Graphs for Parallel Stochastic Gradient Descent** [pdf], course project  
Training SVMs by exploring conflict graphs to parallelize stochastic gradient descent training  
Jan 2015 - May 2015 **Genetic Algorithms for Efficient 3D Printing**, Freshman Research Initiative project  
Minimizing the overhang region in 3D printing using genetic algorithms to obtain slicing planes  
Apr 2015 - May 2015 **Efficient Thread Scheduling**, course project  
Reducing the wait-time for threads by scheduling them based on past CPU and I/O times

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## Coursework

Audited Courses Algorithmic Foundations of Learning (*Patrick Rebeschini*), Computational Learning Theory Oxford, 2021-22 (*Varun Kanade*), Theories of Deep Learning (*Jared Tanner*)  
Audited Courses Linear Algebra and Convexity (*Joel Tropp*), Foundations of Machine Learning and Statistical Caltech, 2018-20 Inference (*Anima Anandkumar*), Foundations of Machine Learning (*Anima Anandkumar*)  
Graduate Courses Convex Optimization (*Constantine Caramanis*), Linear Models (*Peter Müller*), Numerical UT Austin, 2016-18 Analysis: Linear Algebra (*George Biros*)

Undergraduate Machine Learning / Vision: Honors (*Kristen Grauman*), Artificial Intelligence: Honors (*Peter Stone*), Honors Statistics: Honors (*James Scott*), Geometric Foundations of Data Science (*Chandrajit Bajaj*), Introduction to Data Mining (*Adam Klivans*), Introduction to Stochastic Processes (*Stephen Walker*), Introduction to Quantum Information Science (*Scott Aaronson*), Randomized Algorithms (*David Zuckerman*), Algorithms and Complexity: Honors (*Eric Price*), Differential Equations with Linear Algebra: Honors (*Dan Knopf*), Real Analysis I (*Hector Lomeli*), Computational Intelligence in Game Research / Design I & II (*Cem Tutum*), Introduction to Probability & Statistics (*Sinead Williamson*), Matrices and Matrix Calculations (*John Gilbert*), Financial Economics (*Svetlana Boyarchenko*), Introductory Game Theory (*Dale Stahl*), Microeconomic Theory (*Gerald Oettinger*), Principles of Computer Systems: Honors (*Ahmed Gheith*), Computer Organization & Architecture: Honors (*Ahmed Gheith*), Discrete Math for Computer Science: Honors (*Isil Dillig*), Data Structures: Honors (*Calvin Lin*), Competitive Programming (*Etienne Vouga*)

## Other Activities

Oct 2021 - Current Member of the Clarendon Scholars' Association, Oxford  
 Aug 2014 - May 2018 Member of the Turing Scholars Student Association, UT Austin  
 Aug 2014 - May 2018 Member of the Sikh Student Association, UT Austin  
 Aug 2016 - May 2017 School Relations Director for the Undergraduate Machine Learning Labs, UT Austin  
 Oct 2016 Secured seventh position in the Electronic Trading Challenge, UT Austin  
 Jan 2015 - May 2016 Member of the Texas Table Tennis Team, UT Austin with an NCTTA Rank of 689  
 Feb 2016 Secured fourth position and an honorable mention in the dataHACK, UT Austin  
 Aug 2014 - Dec 2015 Member of the Longhorn Cricket Club Team, UT Austin